REMARKS

Favorable reconsideration of this application is requested in view of the following remarks.

Claim 1 has been amended to clarify the flux and include the limitations as supported by the specification at page 5, lines 1-6 and 10-14 and page 6, line 25 – page 7, line 5. Accordingly, claim 5 has been canceled without prejudice, and claims 4 and 20 and withdrawn claim 37 have been amended editorially. Claims 3, 6-7, 14, 21, 24-25, 27, and 30 have been canceled without prejudice. Claims 44 and 45 have been added as supported by the specification at page 15, lines 4-7.

Claims 1, 3-7, 9-12, 17-18, 20, and 26 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. ("Growth of a large GaN single crystal using the liquid phase epitaxy (LPE) technique") (Kawamura I) in view of Sarayama et al. (U.S. Patent Application Publication No. 2002/0046695) and Yamada et al. (U.S. Patent No. 5,366,552). Applicants respectfully traverse this rejection.

Kawamura I discloses use of Na flux solution system to grow GaN crystals (see abstract). Kawamura I, however, fails to disclose the step of dissolving nitrogen-containing gas in the flux of the alkali metal and/or alkaline-earth metal in which the Group III element is dissolved, and further fails to disclose that the flux in which the Group III element and nitrogen-containing gas are dissolved flows continuously on a surface of the seed substrate while the reaction vessel is being rocked as claim 1 requires. Even if all Ga and nitrogen reacted ideally, for 1 mol of Ga, i.e., 69.7 g of Ga, at least 1 mol, i.e., 22.4 liter, of nitrogen-contained gas would need to be dissolved in the flux. By rocking the reaction vessel, dissolution of the nitrogen-containing gas in the flux of the metal element is accelerated, and the flux in which the Group III element and nitrogen-containing gas are dissolved flows regularly on the seed substrate, and thus, sufficient materials necessary for growing the Group-III-element nitride crystals are supplied stably (see page 6, line 25 - page 7, line 5 of the specification). Consequently, the Group-III-element nitride single crystals having high quality can be obtained in an industrial scale

(see *id.* and page 20, lines 13-17 of the specification). Thus, claim 1 is distinguished from Kawamura I.

Sarayama discloses a method to grow crystals of a Group-III-element nitride (see abstract). Sarayama, however, fails to disclose the step of dissolving nitrogen-containing gas in the flux of the alkali metal and/or alkaline-earth metal in which the Group III element is dissolved, and further fails to disclose that the flux including the Group III element and nitrogen-containing gas flows continuously on a surface of the seed substrate while the reaction vessel is being rocked as claim 1 requires. Accordingly, the reference does not remedy the deficiencies of Kawamura I.

Yamada discloses a liquid phase epitaxial growth while a growth chamber is rotated (see abstract and inventive example 1 at coln. 5, line 61 – coln. 6, line 10). In the method of Yamada, a p-type GaAs grows on an n-type GaAs substrate in a liquid phase (see *id.*). The reference does not disclose particular materials included in solution. Also, Yamada discloses neither that the method could be applied to produce GaN, nor that a nitrogen to be included in the GaN is supplied as a nitrogen-containing gas, nor that solution S is a flux of the metal element including an alkali metal and/or alkaline-earth metal as claim 1 requires. Consequently, Yamada further fails to disclose the step of dissolving nitrogen-containing gas in the flux of the alkali metal and/or alkaline-earth metal in which the Group III element is dissolved, and further fails to disclose that the flux including the Group III element and nitrogen-containing gas flows continuously on a surface of the seed substrate while the reaction vessel is being rocked as claim 1 requires. Accordingly, Yamada does not contemplate a method in which a gaseous reactant is used, and from the disclosure of Yamada, there is no reasonable basis to expect that rotating the reaction vessel has advantages in a system using a nitrogen-containing gas. As discussed above, by rocking the reaction vessel, dissolution of nitrogen in the flux of the metal element is accelerated, and the dissolved amount of the nitrogen-containing gas is increased, and contact between the materials in the flux including an alkali metal and/or alkaline-earth metal and nitrogen and the surface of the seed substrate is increased, and consequently, the flux the Group-III-element nitride single crystals with high quality grows effectively (see page 6, line 25 - page 7, line 5 of the specification). Thus, for

Yamada, the results by rocking the reaction vessel are unexpected, and Yamada does not remedy the deficiencies of Kawamura I and Sarayama.

Accordingly, claim 1 and claims 4, 9-12, 17, 18, 20, and 26, and newly added claims 44 and 45, which ultimately depend from claim 1, are distinguished from Kawamura I in view of Sarayama and Yamada, and this rejection should be withdrawn.

Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. ("Growth of a large GaN single crystal using the liquid phase epitaxy (LPE) technique") (Kawamura I) in view of Sarayama et al. (U.S. Patent Application Publication No. 2002/0046695) and Yamada et al. (U.S. Patent No. 5,366,552) as applied above, and further in view of Kawamura et al. ("Synthesis of bulk GaN single crystals using Na-Ca flux") (Kawamura II). Claim 14 has been canceled, and this rejection is moot. Applicants do not concede the correctness of the rejection.

Claims 21 and 24-25 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. ("Growth of a large GaN single crystal using the liquid phase epitaxy (LPE) technique") (Kawamura I) in view of Sarayama et al. (U.S. Patent Application Publication No. 2002/0046695) and Yamada et al. (U.S. Patent No. 5,366,552) as applied above, and further in view of Shibata et al. (U.S. Patent No. 6,270,569). Claims 21, 24, and 25 have been canceled, and this rejection is moot. Applicants do not concede the correctness of the rejection.

Claim 27 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. ("Growth of a large GaN single crystal using the liquid phase epitaxy (LPE) technique") (Kawamura I) in view of Sarayama et al. (U.S. Patent Application Publication No. 2002/0046695) and Yamada et al. (U.S. Patent No. 5,366,552), and further in view of Hawrylo et al. (U.S. Patent No. 3,811,963). Claim 27 has been canceled, and this rejection is moot. Applicants do not concede the correctness of the rejection.

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Claim 30 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al. ("Growth of a large GaN single crystal using the liquid phase epitaxy (LPE) technique") (Kawamura I) in view of Sarayama et al. (U.S. Patent Application Publication No. 2002/0046695) and Yamada et al. (U.S. Patent No. 5,366,552), and further in view of Inoue et al. (Japanese Examined Patent Application Publication No. 75-11870). Claim 30 has been canceled, and this rejection is moot. Applicants do not concede the correctness of the rejection.

In view of the above, Applicants request reconsideration of the application in the form of a Notice of Allowance.

Respectfully submitted,

HAMRE, SCHUMANN, MUELLER & LARSON, P.C.
P.O. Box 2902
Minneapolis, MN 55402-0902
(612) 455-3800

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By: _____
Douglas P. Mueller
Reg. No. 30,300

DPM/my/jls